

NAME P/N QTY	CRIT	FAILURE MODE & CAUSES	FAILURE EFFECT	RATIONALE FOR ACCEPTANCE
COMMON MULTIPLE CONNECTOR, ITEM 330 ----- SV778872-26 (1)	2/2	330FM18 Restricted O2 flow. Oxygen filter clogging; orifice clogging.	END ITEM: O2 flow path blocked through the multiple connector. GFE INTERFACE: Unable to recharge the primary O2 bottles. (111). MISSION: Unable to recharge EMU or supply O2 for denitrogenizati on prior to airlock depressurizatio n. Unable to use one EMU. CREW/VEHICLE: None. TIME TO EFFECT /ACTIONS: Seconds. TIME AVAILABLE: N/A TIME REQUIRED: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A	A. Design - The Oxygen Filter is constructed from pure nickel per ASTM B160-75, with a 25 micron absolute, glass bead rating. The oxygen orifice is 0.0135+/-0.0015 dia. and is protected by the oxygen filter. The filter is designed to be removed as required. B. Test - Component Acceptance: A coupled oxygen flow test is performed. Per Airlock Inc. ATP9619-08. With a supply pressure of 740-745 psia O2. The oxygen flowrate must be 5.0-5.2 lb/hr and the pressure drop 30-40 psia. PDA: A flow test is performed on the oxygen line per SEMU-60-005. With an inlet pressure of 786-790 psia, the oxygen line including the filter and orifice, must flow 5.0-5.2 lbs/hr oxygen at a pressure drop of 25-45 psid. Certification: Certified for a useful life of 15 years. C. Inspection - A cleanliness level of HS3150 EM50A is maintained during assembly and testing of the item. This level requires a mandatory inspection for verification. D. Failure History - H-EMU-385-A001 (05/20/96) - During acceptance testing, O2/H2O Manifold S/N 008 exceeded oxygen pressure drop requirement with 49.9 psid vs. spec of 25 - 45 psid. Found Item 330 DCM Multiple Connector oxygen line orifice inlet radius to be less than spec. Drawing revised to make break edge easier to manufacture and inspect. Also tightened pressure drop limits for orifice as a detail to allow some margin when installed in top level assembly. J-EMU-498--001 (04/09/99) - Aluminum and stainless steel particulate contamination (coming from the IEU multiple connector end) found in the oxygen circuit of the ISS EMU Umbilical during particulate sampling prior to Space Station Acceptance Test Article testing. Assembly of O2 hose to multiple connector adapter fittings is probable cause of stainless steel contamination. Mating of the SCU and DCM multiple connectors is apparent cause of aluminum particles. Engineering Change 182117-167 generated to revise Dynatube fitting installation procedure SVHS6844. This change defines an assembly method to reduce potential particle contamination of the oxygen circuit. The SCU and Umbilical drawings will also be revised to insure final assembly cleanliness. H-EMU-410--002 (04/15/99) - Mating between SCU and DCM multiple connectors showed actual pressure drop of 50 psid. Specified pressure drop is 30-40 psid. Worst case dimensional conditions of SCU Multiple Connector and Common Multiple Connector O2 plungers could result in inadequate retraction, causing reduced oxygen flow through the cross drilled holes which provide flow through the plungers. Dimensional tolerance study of components was completed prior to implementation of electronic tolerancing equipment, like CADKEY. Current utilization of such equipment provides improved tolerancing between details for more accurate assembly. Recommendation made to

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		330FM18		<p>revise Hamilton Suandstrand's Engineering Definition of Procured Parts In SSI (Engineerign Systems Manual 4330) to ensure all critical features and characteristics are evaluated under all tolerance conditions. SCU/DCM and ISS EMU Umbilical O2 plungers will be redesigned to provide maximum O2 flow between the SCU and DCM multiple connectors. The plunger cross-drilled holes will be moved outward to minimize obstruction between the O2 plunger and poppet. The plunger diameter tolerance will be reduced .001 to increase the clearance between the plunger and poppet to provide maximum flow between the O2 plunger and poppet details. Ref. Engineering Changes 182135-254 (SCU), 182135-255 (IEU), 182135-256 (DCM), and CCBD H6937.</p> <p>E. Ground Turnaround - Tested for non-EET processing per FEMU-R-001, V1103.02 Orbiter Checkout. FEMU-R-001 Para 8.2 EMU Preflight KSC Checkout for EET processing.</p> <p>F. Operational Use - Crew Response - PreEVA: Trouble shoot problem, if no success, consider use of third EMU if available. Otherwise EMU no go for EVA. Training - Standard EMU training covers this failure mode. Operational Considerations - EVA checklist procedures verify hardware integrity and systems operational status prior to EVA.</p>

EXTRAVEHICULAR MOBILITY UNIT
SYSTEMS SAFETY REVIEW PANEL REVIEW
FOR THE
I-330 COMMON MULTIPLE CONNECTOR
CRITICAL ITEM LIST (CIL)

EMU CONTRACT NO. NAS 9-97150

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